

Geophysical Survey Field Operations and Compliance Report

Acoustic Natural Hydrocarbon Seep Flux Survey at the Coal Oil Point Seep Field

CSLC PRC 9361

Survey period August 31 - September 13, 2016

Submitted by the University of California, Santa Barbara and University of New Hampshire, Principal Investigators: David Valentine (UCSB) and Tom Weber (UNH)

All studies performed aboard UCSB's R/V Connell

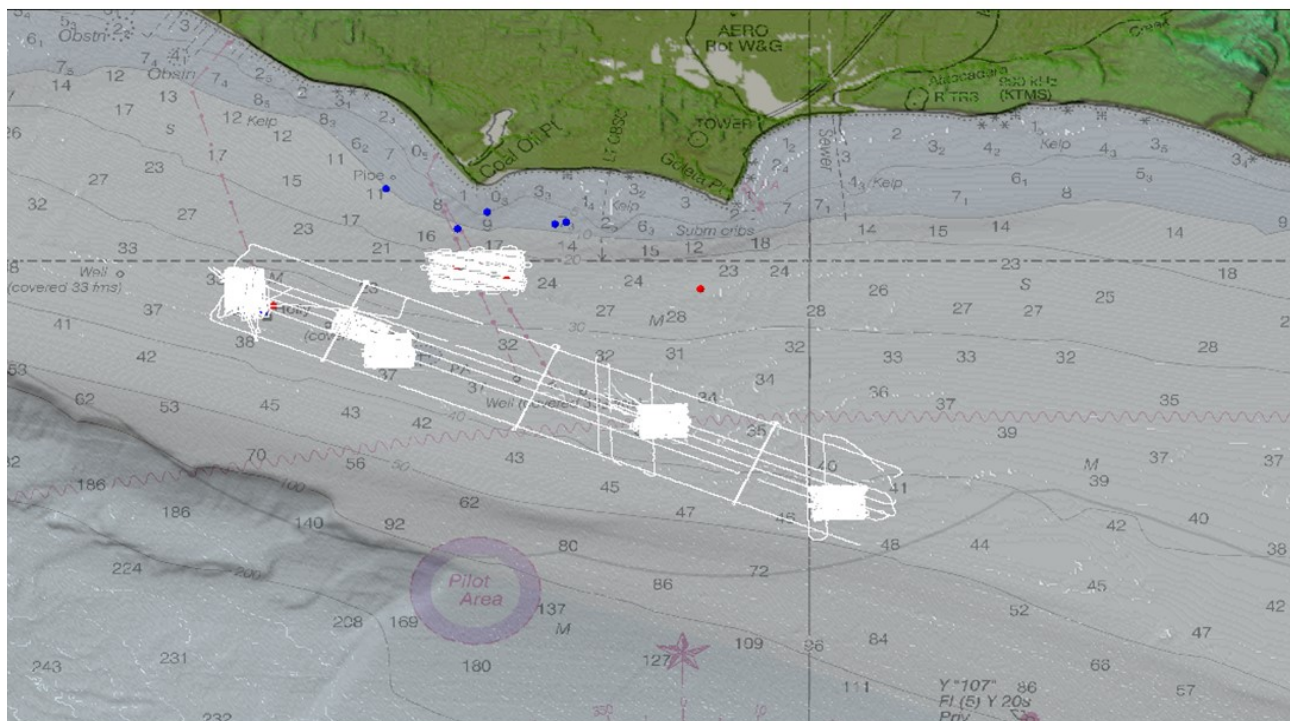
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1. Overview of geophysical survey transects, all surveys, Aug 31 to Sept 14.



2.0 Environmental Hazard and Other Incident Report

This survey was uneventful in terms of environmental hazards encountered or other incidents.

Seas were mostly favorable.

No spills of oil or fuel occurred.

No days were greater than ten hours of acoustic equipment operation. As seen in the daily report, our longest day, Sept. 7, we left SB Harbor at 0700 but did not commence survey until 0800, and so were just under 10 hours with the 1740 stop time. No nighttime operations occurred.

Fortunately, visibility was not an issue during this survey. Conditions were either overcast or sunny, fog was not an issue. Therefore we never had to suspend operations to account for this.

We had multiple days of operations in the vicinity around Platform Holly and made contact with personnel there previous to operations.

3.0 Biological Information

Observations of marine mammals within the exclusion zone are reported in the tables in section 4.2 below. We treated the 321m safety zone as our minimum safety zone for the majority of the survey (all days except the last day) after discussions with CSLC staff (email K. Keen). 321m is the distance to the 160db isopleth for the 30-100kHz MSI CBW instrument. A presurvey "exhibit f" document had listed a longer 384m distance which was calculated for lower frequencies (10-100kHz), however, the MSI CBW transducer was used in the higher frequency (30-100kHz) setting for the entire survey which had a shorter distance to the 160db isopleth. Other higher frequency instruments were also employed but with shorter safety zones (~134m).

For all events listed in the marine mammal observation table (section 4.2) instruments were immediately powered down and not turned back on until wildlife exited the safety zone.

No collisions with marine wildlife occurred.

3.1 Narrative description

Our survey was without major or minor incident in terms of observed adverse effects on marine wildlife. Out of all of the observations of mammals in the safety zones listed in the tables of section 4.2 below, no wildlife appeared to be distressed or affected by the acoustic signal. Early September does not coincide with whale migrations, we observed no whales and our observations were limited to Common Dolphins (Short Beaked) and California Sea Lions.

CA Sea lions were a little inquisitive on a couple of occasions but not exceedingly so. On Sept. 6th the CA sea lions observed at the 1:10pm time frame took some interest in our vessel but rapidly realized we had no food source, and lost interest in under a minute. On a couple of instances we took advantage of the fact that sea lions were resting/sleeping above water on buoys or platform. We made sure of the fact that no sea lions were swimming before surveying, and the 12:35pm entry on Sept. 6th was an example of respecting a sea lion waking and swimming (and turning off of the equipment). The Sept. 8th 3:05pm was an event where we observed a sea lion, halted operations, and then watched it jump on to a buoy to rest (not out of distress) and resumed operations.

Operations were also halted due to dolphin sightings, on these occasions the dolphins were first noted from a long distance away and dolphins were in normal transit. "Bait balls" were observed on a couple of occasions during transit from Santa Barbara Harbor to the study area, at about halfway into the 10 mile transit, but not during operations, but in those instances we did not observe feeding dolphins or sea lions as we were just traveling through.

A concern of the CDFW agents was any impact on kelp in the MPA portion of our survey (and non-MPA waters as well). But just as we had predicted in our Scientific Collection Plan Amendment (CDFW SC-12139), as our survey was mostly confined to areas >~50m water depth no attached kelp forest was affected at all. On occasion we surveyed the area near Trilogy seep (approx. 30m water depth) but did not encounter kelp either. We did on various occasion steer around floating aged detached kelp masses, perhaps once a day we removed a small kelp frond that had lodged itself in the bars of the acoustic tow sled.

Sept. 14th was the last day of the survey and the day which we swapped transducers to the lower frequency equipment (1-10 kHz "Edgetech DW216"). This was the only day in which this low frequency equipment was used. This equipment was used to possibly differentiate natural gas bubble size. Note that on the table we have no entries for Sept. 14th, we briefly observed a pod of dolphins at great distance, not within the safety zone (which was 100m to the 160dB isopleths for this lower frequency gear). In our exploratory drift through the seep gas and oil on the W side of Platform Holly as the equipment was operating, in the brief moments which we were closest to Holly, we were on the opposite side of Platform Holly to a couple of CA Sea Lions which were resting on the platform itself and not in the water. We are certain that this wildlife was not affected during this lowest frequency portion of the survey as well.

3.2 Marine Mammal Observer observation tables (2 pages):

Valentine/Weber MWM Marine Mammal Observation Sheet

Monitors: Christian Orsini or Christoph Pierre
Marine Mammal Observations
Project Name: Valentine UCSB PRC 9361

Date: Aug.31-Sept.14, 2016 Sheet 1 of 2 for this day- survey
Monitor: see initials Monitoring Location: Campus Point, Coal Oil Point Areas

Sighting #	Time of Day	Weather	Species	# of Individuals	Location*	Behavior/Construction Activity	observer
1 - 9/1	11:25am	sun	common dolphin	2	Patch Seep	transiting	C.O.
2 - 9/1	2:23pm	sun	common dolphin	1	500m E of Platform Holly	transiting	C.O.
3 - 9/2	11:00am	sun	common dolphin	200	2.5km south of More Mesa	transiting	C.P.
4 - 9/6	12:35pm	sun	CA Sea Lion	3	W Platform Holly	Circling buoy	C.P.
5 - 9/6	1:10pm	sun	CA Sea Lion	3	E Platform Holly	Circling Platform	C.P.
6 - 9/7	1:15pm	overcast	common dolphin	3	Ia Goleta	transiting	C.O.
7 - 9/8	10:51am	partly cloudy	CA Sea Lion	1	Trilogy	resting/sleep	C.P.

*E.g., Direction, Distance Estimate or Mark on Figure with Sighting Number
*see figure following these tables for further location information

Valentine/Weber MWM Marine Mammal Observation Sheet

Marine Mammal Observations
 Project Name: Valentine UCSB PRC 9361

Monitors: Christian Orsini or Christoph Pierre

Date: Aug. 31-Sept 14, 2016 Sheet 2 of 2 for this day-survey

Monitor: see initials Monitoring Location: Campus Point, Coal Oil Point Areas

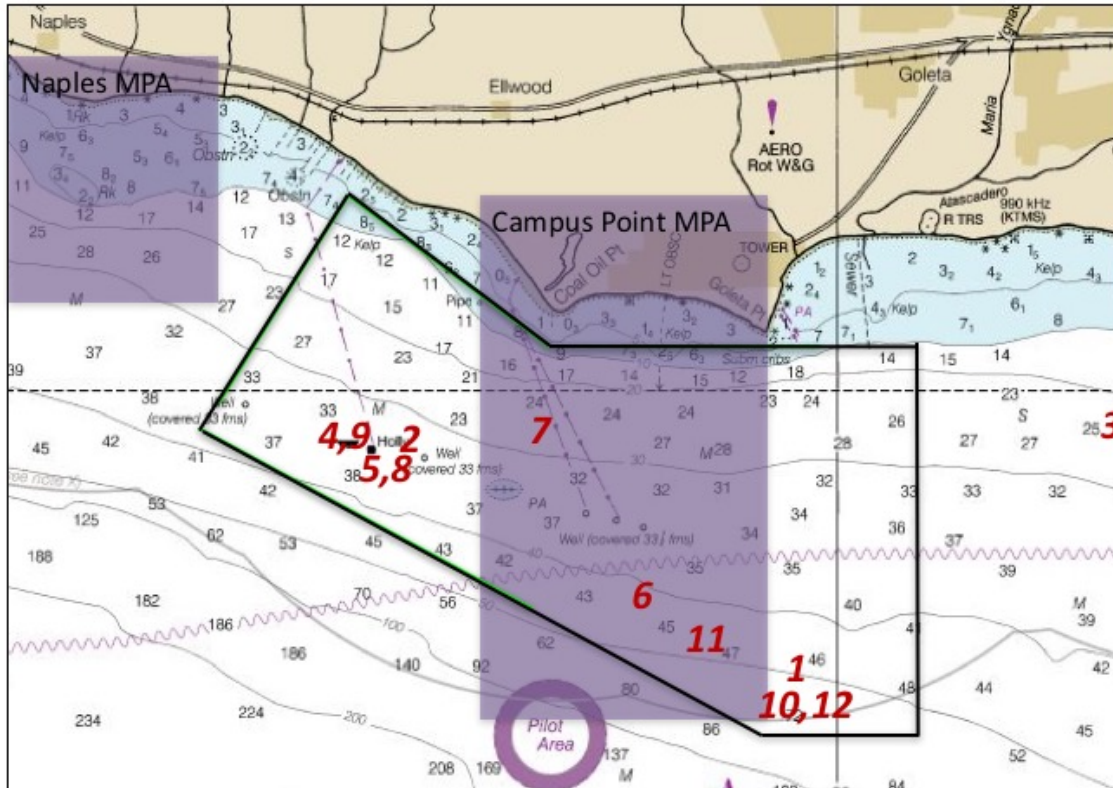
Sighting #	Time of Day	Weather	Species	# of Individuals	Location*	Behavior/Construction Activity	observer
8 - 9/8	2:22pm	sun	CA sea lion	2	Platform Holly	curious swim towards vessel, then departed	C.P.
9 - 9/8	3:05pm	sun	CA sea lion	1	Holly Buoy (W)	transiting	C.P.
10 - 9/9	9:15am	overcast	CA sea lion	2	SW of patch seep	transiting	C.O.
11 - 9/9	1:22pm	partly cloudy	common dolphin	50	between La Goleta and Patch seep	transiting	C.O.
12 - 9/13	8:50	overcast	CA sea lion	1	Patch	curious swim towards vessel, then departed	C.P.

*E.g., Direction, Distance Estimate or Mark on Figure with Sighting Number

*See figure following these tables for further location information

3.3 Marine Mammal Observer observation location figure:

Excerpt from NOAA Nautical Chart 18721 with Proposed Survey Area
Acoustic Survey Notice, Offshore Goleta/Ellwood, California



3.4 Marine Mitigation Compliance report

Appendix A lists the Mitigation Measures followed by this survey (Exhibit H). All mitigation measures in Exhibit H and in our Marine Wildlife Contingency plan were respected and implementation for each measure is catalogued in appendix A.

4. Daily Surveys

Equipment Used during daily surveys unless otherwise stated.

- MSI CBW: 30-100 kHz, 4ms pulse
- Simrad EK80 200: 150-250 kHz, 2 ms pulse
- Simrad EK80 333: 290-490 kHz, 2 ms pulse
- Tow sled with transducers / Garmin WAAS-enabled GPS
- Trimble WAAS-enabled GPS for line driving
- Seabird 19plus V2 CTD
- RDI ADCP, 300kHz

4.1 “Shakedown” August 31 and September 1, 2016

Overview

Equipment integration and testing was performed on two shakedown cruises, resulting in minor modifications to the equipment configuration. Equipment operation was sporadic on Aug. 31, no mammals were observed on Aug. 31 when acoustic instruments were operating. Acoustic testing was more extended on Aug. 31, see the marine mammal observation table in section 4.2 for the occasions on Sept. 1-14 in which acoustic equipment power was turned off due to mammal vicinity.

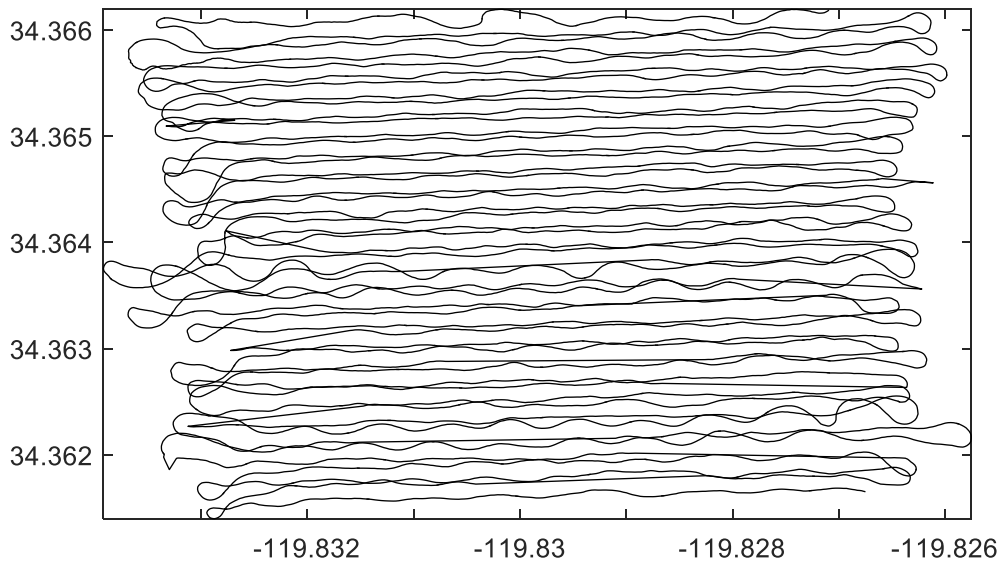
4.2 Survey September 2, 2016

Overview

This was the first full day of survey operations at the Coal Oil Point gas seeps (day 3 overall).

- Departure from Santa Barbara Harbor at 0830.
- A 500x500 m survey was conducted at Patch seep (one of the control areas) using 10 m line spacing. Broadband echosounders were deployed on a tow sled; the tow sled was rafted next to the R/V Connel on the starboard side, aft. Vessel speed during the survey was ~5 kts, and the survey took 4 hours to complete. Gas seepage was visible throughout the survey, both in the acoustic data and occasionally visible by eye in the water column. The sea surface was lightly oiled in some areas of the survey.
- Following the survey, a CTD cast was conducted. Following the CTD, a short (500 m) transect ADCP survey was conducted.
- Field operations ceased at 1500 and the vessel returned to port in order to provide the survey team with some extra post-processing.
- Weather conditions were good – light breeze, overcast for most of the day, few feet of swell running E-W.

Trackline:



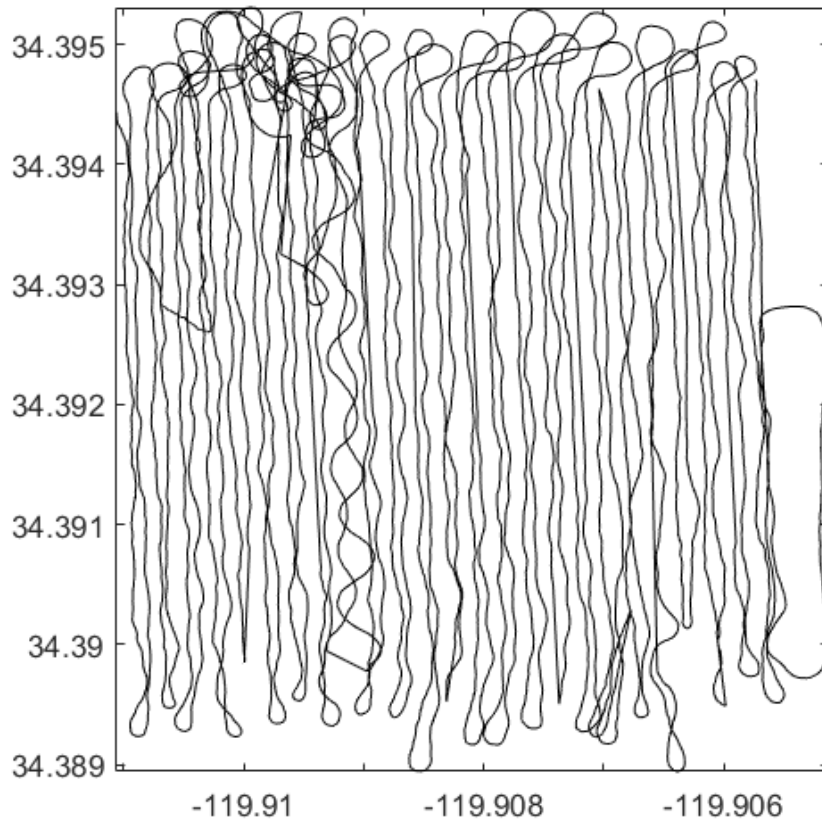
4.3 Survey September 6, 2016

Overview

This was day 4 of boat operations at Coal Oil Point gas seeps.

- Departure from SB Harbor 0830.
- A N-S aligned 500x500 m survey was conducted near Platform Holly using 10 m line spacing. Broadband echosounders were deployed on a tow sled; the tow sled was rafted next to the R/V Connel on the port side, aft. Vessel speed during the survey was ~5 kts, and the survey took 4 hours to complete. Gas seepage was visible predominantly near Platform Holly, both in the acoustic data and significantly by eye near the platform. The sea surface was heavily oiled, especially near Platform Holly.
- Following the survey, a CTD cast was conducted near the center of the survey area
- An initial attempt at calibrating was performed south of platform holly. The seas in the area were more developed than closer to shore. It was decided to move to the east of Patch to get close to shore while avoiding seeps during the calibration. Performed calibration using 38.1 mm and 25.0 mm WC calibration spheres. The 12.67mm sphere was too small and light to perform a field calibration with.
- Field operations ceased at 1610 and the vessel returned to port.
- Weather conditions were good for surveying. 2-3 foot rising to 3-4 foot 8 second period swells in the afternoon. Winds were 5 to 10 knots in the morning and 10 to 15 knots in the afternoon.

Trackline:



4.4 Survey September 7, 2016

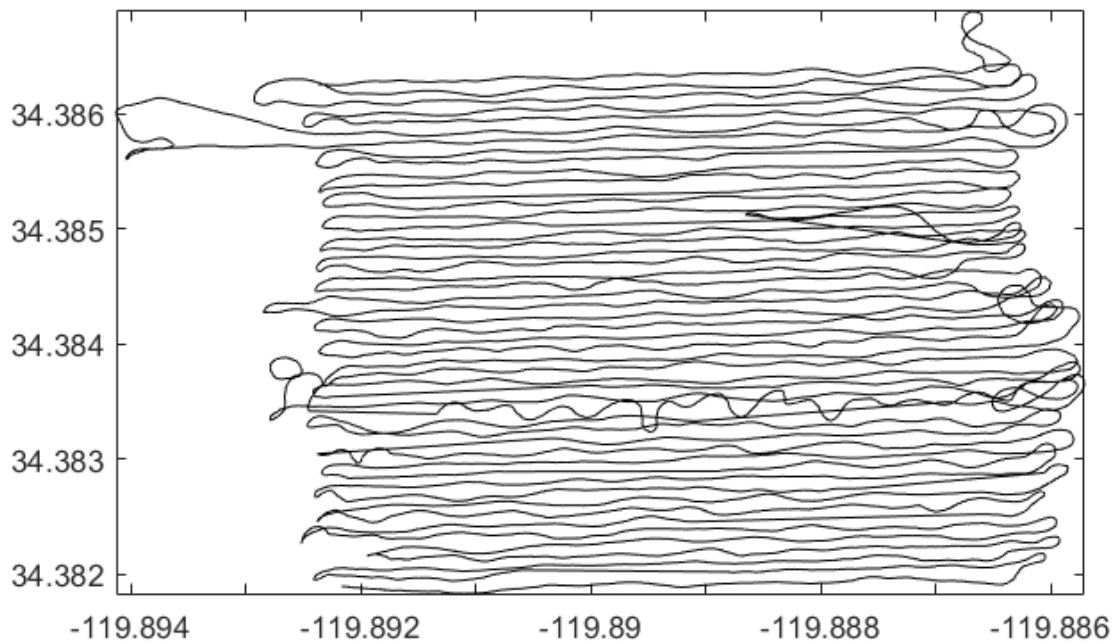
Overview

This was day 5 of boat operations at Coal Oil Point gas seeps.

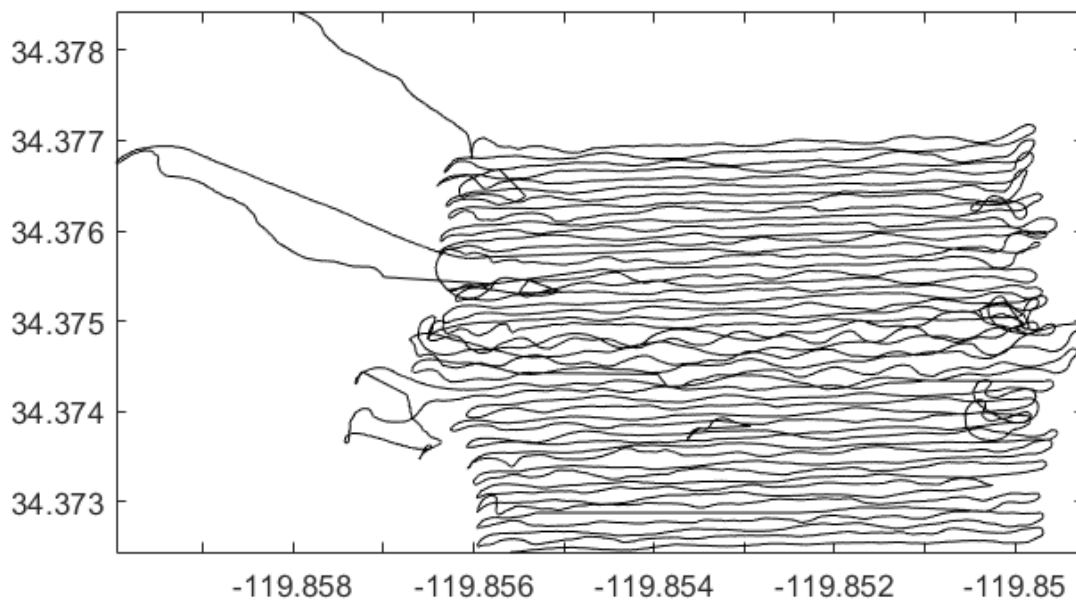
- Departure from SB Harbor 0700.
- A EW 500x500 m survey was conducted at Seep Tent in the morning followed by La Goleta in the afternoon using 10 m line spacing. Broadband echosounders were deployed on a tow sled; the tow sled was rafted next to the R/V Connel on the port side, aft. Vessel speed during the survey was ~5 kts, and the Seep Tent survey took 4 hours to complete and La Goleta 4 hours and 40 minutes. The sea surface was heavily oiled, especially near Seep Tent. Gas was also visible at the surface at both locations, but significantly more was observed near La Goleta than at Seep Tent. Initial observations indicate that Seep Tent contained more oil at the surface than gas, especially compared to other sites.
- Following the Seep Tent survey, a CTD cast was conducted near La Goleta
- Field operations ceased at 1740 and the vessel returned to port.
- Weather conditions were less favorable than previous days for surveying. 2-3 foot swell was present from the north all day. This was combined with wind driven waves from the east rising from <2' to >3'. The swell and wind waves resulted in confused seas, making for less than ideal boating conditions. The

conditions, however, did not appear to affect the data significantly. Winds were 5 to 10 knots in the morning and 10 to 15 knots in the afternoon and rose above 15 knots for the last hour of survey and transit to the harbor.

Seep Tent Trackline:



La Goleta Trackline



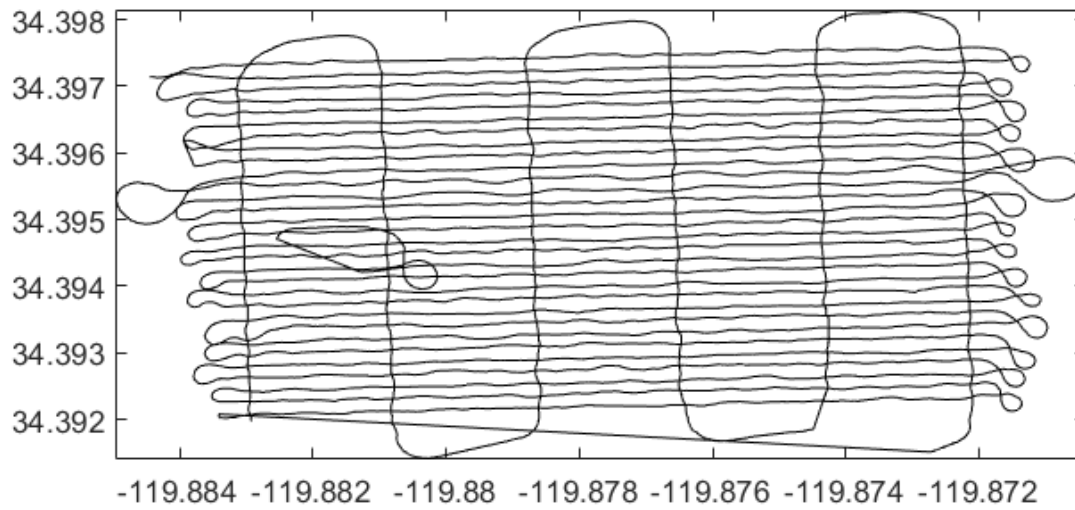
4.5 Survey September 8, 2016

Overview

This was day 6 of boat operations at Coal Oil Point gas seeps.

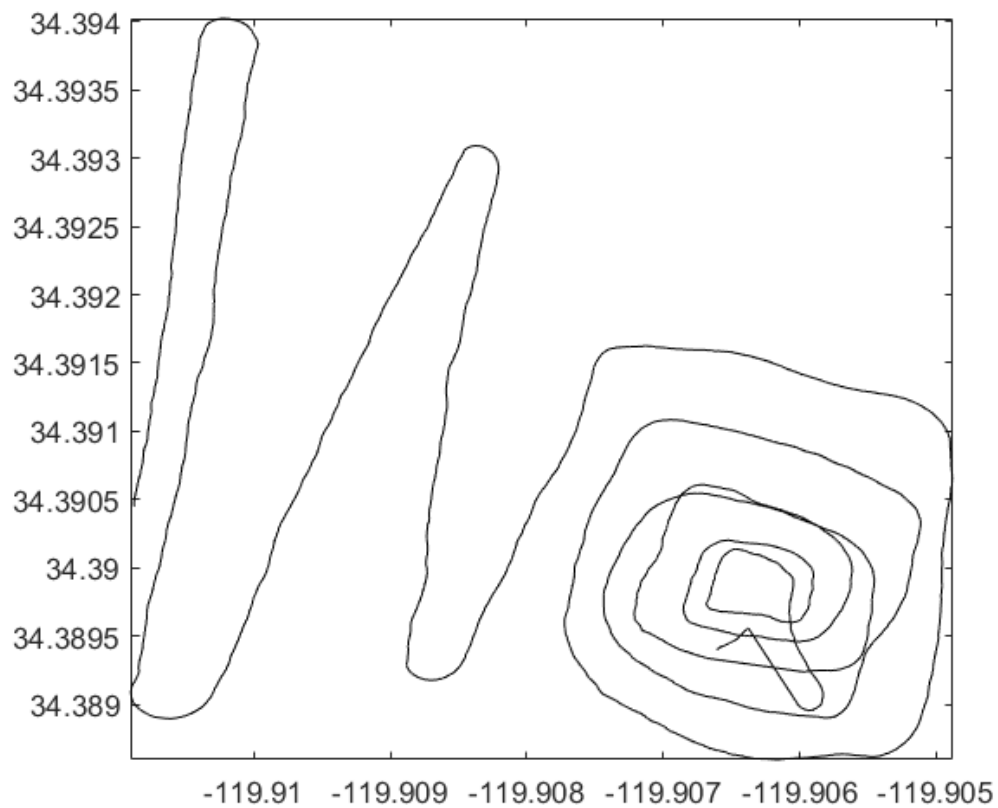
- Departure from SB Harbor 0730.
- A EW 1000(EW)x600(NS) m survey was conducted in the shallow area near Trilogy with 20 m line spacing, followed by 6 evenly spaced lines going NS. Broadband echosounders were deployed on a tow sled; the tow sled was rafted next to the R/V Connell on the port side, aft. Vessel speed during the survey was ~5 kts, and the Trilogy area survey took 4.5 hours to complete. The sea surface was somewhat oiled. A significant quantity of gas was seen at 3 distinct points around the Trilogy seep location.
- Following the Trilogy area survey, a CTD cast was conducted in the Trilogy area.
- ADCP operations were performed around platform Holly following the Trilogy survey. A NS line was run, once going north and then repeated going south, to the west of Holly. A similar NS line performed in both directions was performed very close to the platform on the east side. It appeared that the lines were too close to the platform, and the pilings were causing issues with the data. Another NS line, heading north and then south, was completed farther east from the platform.
- Another platform Holly survey was then completed with the same configuration as the Trilogy survey. Lines were run as circles around the platform, starting as close as possible to the platform and extending the circle diameter until the sled was out of the seep area.
- Field operations ceased at 1545 and the vessel returned to port.
- Weather conditions favorable surveying. <3 foot swell was present from the north all day. Winds were 5 to 10 knots.

Trilogy Trackline:



Holly

Trackline:



4.6 Survey September 9, 2016

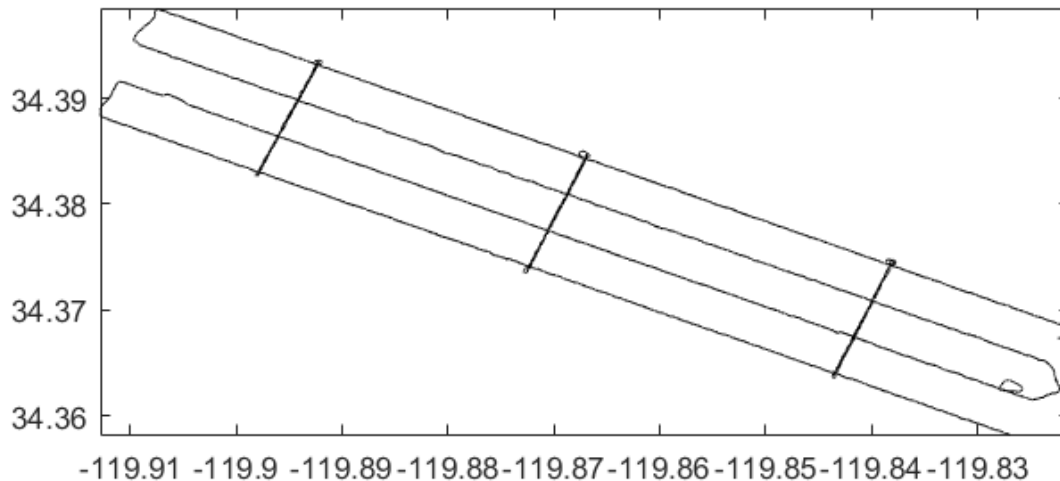
Overview

This was day 7 of boat operations at Coal Oil Point gas seeps.

- Departure from SB Harbor 0730.

- A roughly EW 1300 x 8500 m survey was conducted encompassing Holly, Seep Tent, La Goleta and Patch with 412.5 m line spacing, followed by 3 groups of 2 lines going roughly NS spaced evenly between each pair of seeps. Broadband echosounders were deployed on a tow sled; the tow sled was rafted next to the R/V Connell on the port side, aft. Vessel speed during the survey was ~5 kts, and the survey took 5 hours to complete.
- Following the survey, a CTD cast was conducted near Patch.
- ADCP operations were performed near Patch following the broad area survey. A roughly NS line was run, once going north and then repeated going south.
- Field operations ceased at 1500 and the vessel returned to port.
- Weather conditions favorable surveying. <3 foot swell was present from the north all day. Winds were 5 to 10 knots.

Broad Survey Trackline:



4.7 Survey September 12, 2016

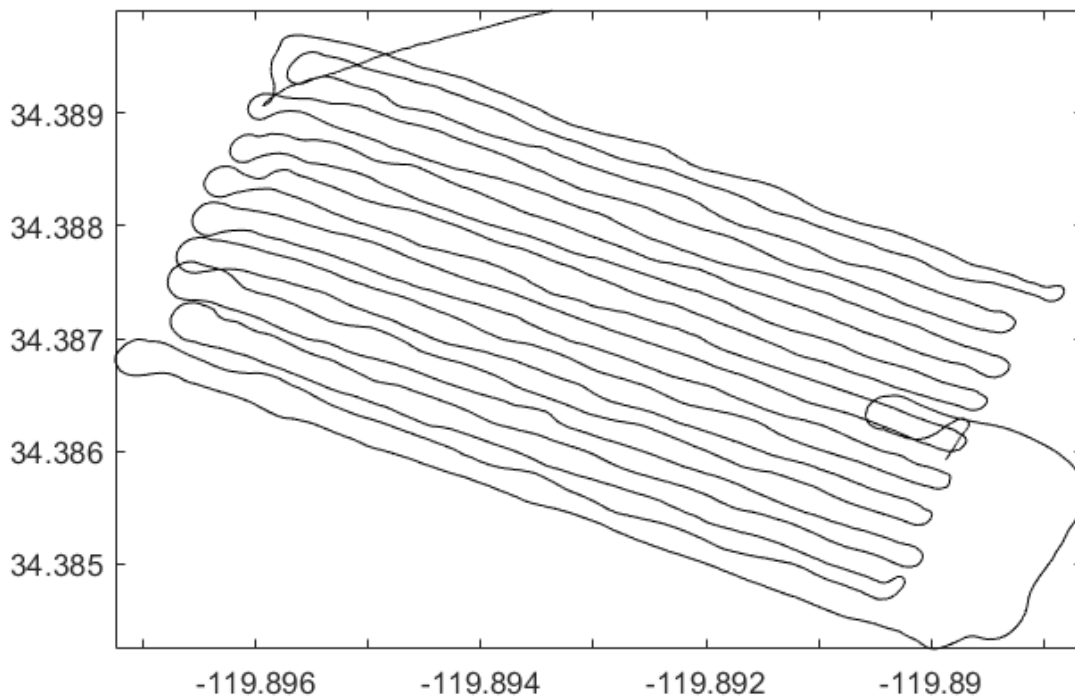
Overview

This was day 8 of boat operations at Coal Oil Point gas seeps.

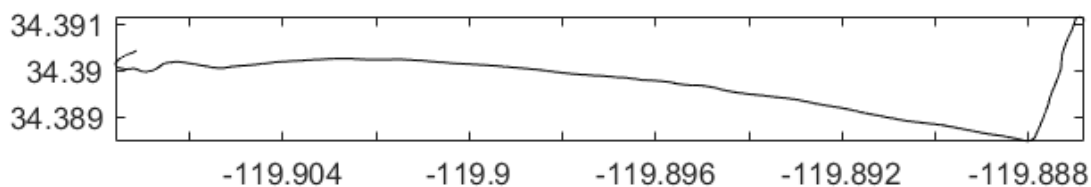
- Departure from SB Harbor 0730.
- A roughly EW 600 x 8500 m survey was conducted to the Northwest of Seep Tent with 20 m line spacing. Broadband echosounders were deployed on a tow sled; the tow sled was rafted next to the R/V Connell on the port side, aft. Vessel speed during the survey was ~5 kts, and the survey took ~1 hours to complete.
- Following the survey, an ADCP survey was conducted near Seep Tent. A line was run heading roughly North and then rerun in the opposite direction.

- A line was run with the broadband echosounders from the ADCP survey to platform Holly. A line was run heading roughly North and then rerun in the opposite direction.
- An ADCP survey was then conducted near platform Holly.
- A survey was then performed near the seep at Holly with the broadband echosounders. The survey was conducted with the intent of locating oil surfacing near the gas seep. A variety of survey paths were used to try and isolate the oil, including steering directed by observers looking for gas and oil.
- Field operations ceased at 1530 and the vessel returned to port.
- Weather conditions favorable surveying. <2 foot swell was present all day. Winds were ~5 knots.

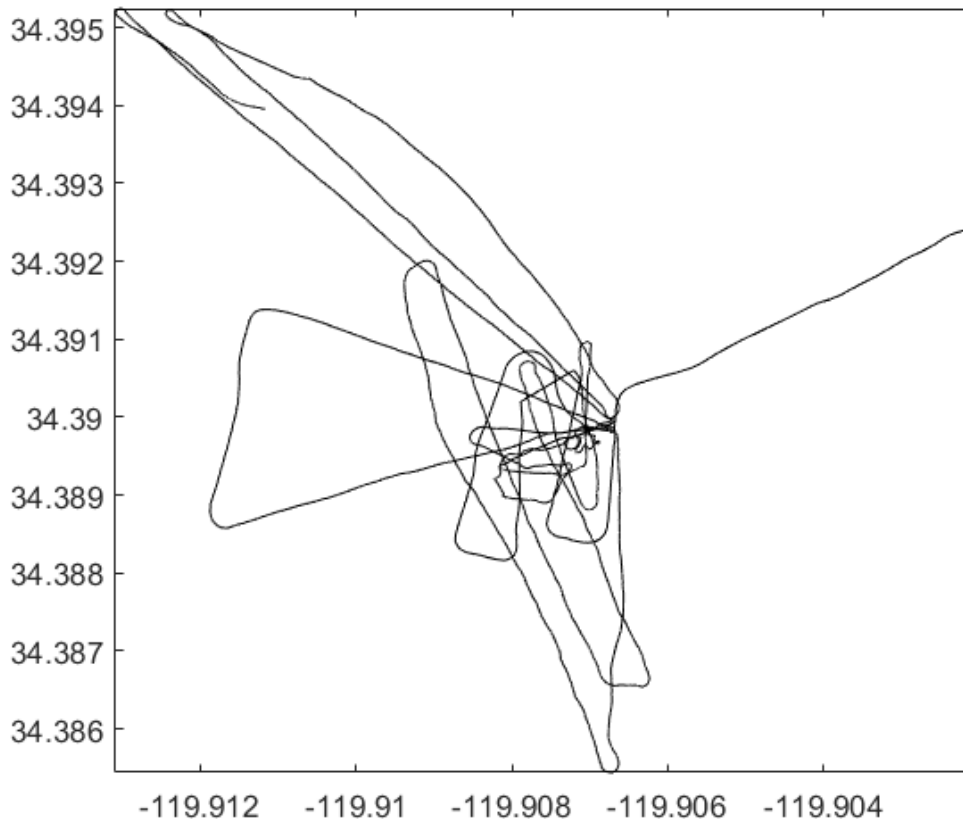
Seep Tent Trackline:



Transit Trackline:



Holly Trackline:



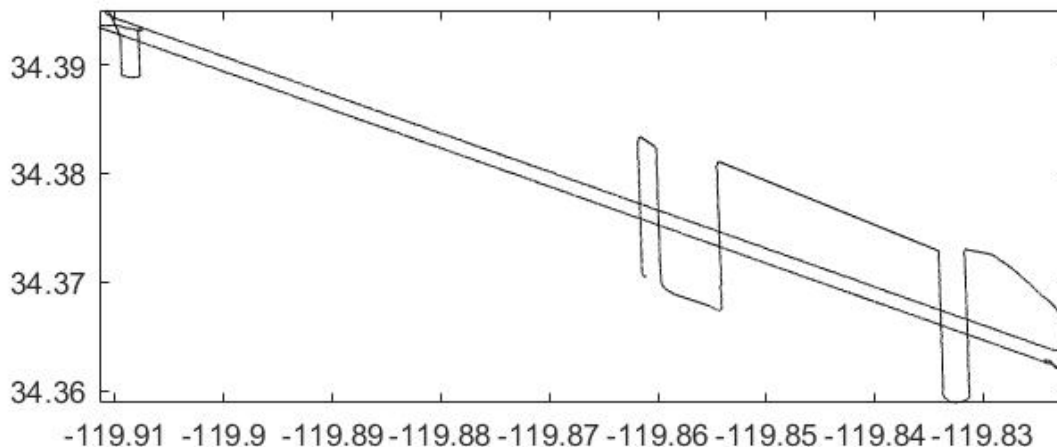
4.8 Survey September 13, 2016

Overview

This was day 9 of boat operations at Coal Oil Point gas seeps.

- Departure from SB Harbor 0800.
- A roughly EW broadscale survey was conducted as two lines in between the center two lines of the previous broadscale survey. At the end of the first line, near platform holly, two lines were run NS. One line was run through the center of the most gassy area of previous surveys and one farther west near where oil had been seen surfacing. After the holly survey, the second broadscale survey was run, followed by lines going NS through the center of, and then west of, Patch followed by La Goleta. Broadband echosounders were deployed on a tow sled; the tow sled was rafted next to the R/V Connell on the port side, aft. Vessel speed during the survey was ~5 kts, and the survey took 5 hours to complete.
- Following the survey, a CTD cast was conducted near Patch.
- Field operations ceased at 1300 and the vessel returned to port.
- Weather conditions favorable surveying. <2 foot swell was present from the north all day. Winds were ~5 knots. Skies were mostly clear.

Trackline



4.9 Survey September 14, 2016 Broad scale survey, including Platform Holly

Equipment Used

- LF: 1-10 kHz, 32 ms pulse length
- Tow sled with transducers / Garmin WAAS-enabled GPS
- Trimble WAAS-enabled GPS for line driving
- Seabird 19plus V2 CTD

Overview

This was day 9 of boat operations at Coal Oil Point gas seeps.

- Departure from SB Harbor 0800.
- Low Frequency transducers were deployed on a tow sled; the tow sled was rafted next to the R/V Connell on the port side, aft. Vessel speed during the survey was ~3-4 kts.
- Two broad survey lines were surveyed. The first was towards the NW (towards Platform Holly) and the second was towards the SE (towards Patch). One NS line was conducted to the west of Platform Holly and then we collected data while drifting around the west side of the platform. While surveying the SE broad survey line, we would stop and collect NS transects at Seep Tents, La Goleta and Patch. Also, for each of these location, data was collected while drifting atop the seeps where we could visually confirm the presence of methane bubbles reaching the surface.
- Following the survey, a CTD cast was conducted near Patch.
- Field operations ceased at 1600 and the vessel returned to port.
- Weather conditions favorable surveying. <2 foot swell was present from the north all day. Winds were ~5 knots. Skies were mostly clear.

- Visual observations of oil droplets rising in the water column, especially near Platform Holly.

Trackline:

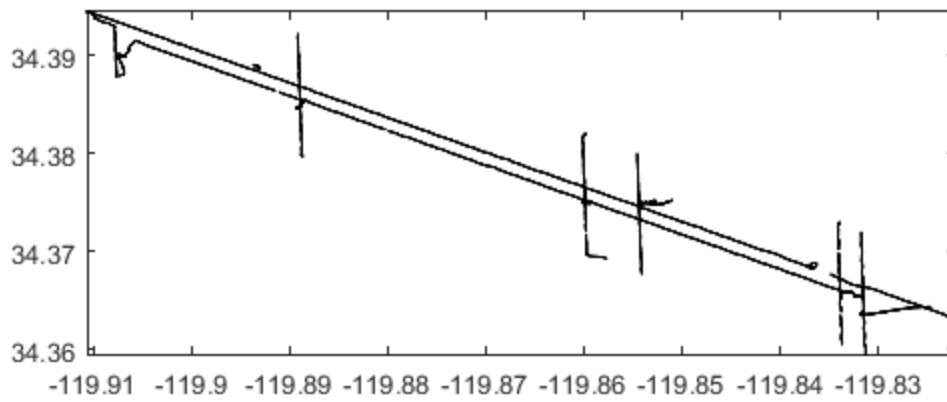


EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
Air Quality and Greenhouse Gas (GHG) Emissions (MND Section 3.3.3)						
MM AIR-1: Engine Tuning, Engine Certification, and Fuels. The following measures will be required to be implemented by all Permittees under the Offshore Geophysical Permit Program (OGPP), as applicable depending on the county offshore which a survey is being conducted. Pursuant to section 93118.5 of CARB's Airborne Toxic Control Measures, the Tier 2 engine requirement applies only to diesel-fueled vessels.	<u>All Counties:</u> Maintain all construction equipment in proper tune according to manufacturers' specifications; fuel all off-road and portable diesel-powered equipment with California Air Resources Board (CARB)-certified motor vehicle diesel fuel limiting sulfur content to 15 parts per million or less (CARB Diesel).	Daily emissions of criteria pollutants during survey activities are minimized.	Determine engine certification of vessel engines.	OGPP permit holder and contract vessel operator; California State Lands Commission (CSLC) review of Final Monitoring Report.	Prior to, during, and after survey activities. Submit Final Monitoring Report after completion of survey activities.	fk 8/24/16 certs. located
	<u>Los Angeles and Orange Counties:</u> Use vessel engines meeting CARB's Tier 2-certified engines or cleaner; the survey shall be operated such that daily NO _x emissions do not exceed 100 pounds based on engine certification emission factors. This can be accomplished with Tier 2 engines if daily fuel use is 585 gallons or less, and with Tier 3 engines if daily fuel use is 935 gallons or less.		Review engine emissions data to assess compliance, determine if changes in tuning or fuel are required. Verify that Tier 2 or cleaner engines are being used. Calculate daily NO _x emissions to verify compliance with limitations.			
	<u>San Luis Obispo County:</u> Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 585 gallons or less; all diesel equipment shall not idle for more than 5 minutes; engine use needed to maintain position in the water is not considered idling; diesel idling within 300 meters (1,000 feet) of sensitive receptors is not permitted; use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Verify that Tier 2 or cleaner engines are being used. Inform vessel operator(s) of idling limitation. Investigate availability of alternative fuels.			
	<u>Santa Barbara County:</u> Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 790 gallons or less.		Verify that Tier 2 or cleaner engines are being used. Investigate availability of alternative fuels.			fk 8/24/16 certs. located
	<u>Ventura County:</u> Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.		Investigate availability of alternative fuels.			

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-1: Marine Mammal and Sea Turtle Presence – Current Information.	All State waters; prior to commencement of survey operations, the geophysical operator shall: (1) contact the National Oceanic and Atmospheric Administration Long Beach office staff and local whale-watching operations and shall acquire information on the current composition and relative abundance of marine wildlife offshore, and (2) convey sightings data to the vessel operator and crew, survey party chief, and onboard Marine Wildlife Monitors (MWMs) prior to departure. This information will aid the MWMs by providing data on the approximate number and types of organisms that may be in the area.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Document contact with appropriate sources. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; Inquiry to NOAA and local whale watching operators.	Prior to survey.	fk 8/10/16 (comm. Dan Lawson NOAA)
MM BIO-2: Marine Wildlife Monitors (MWMs).	Except as provided in section 7(h) of the General Permit, a minimum of two (2) qualified MWMs who are experienced in marine wildlife observations shall be onboard the survey vessel throughout both transit and data collection activities. The specific monitoring, observation, and data collection responsibilities shall be identified in the Marine Wildlife Contingency Plan required as part of all Offshore Geophysical Permit Program permits. Qualifications of proposed MWMs shall be submitted to the National Oceanic and Atmospheric Administration (NOAA) and CSLC at least twenty-one (21) days in advance of the survey for their approval by the agencies. Survey operations shall not commence until the CSLC approves the MWMs.	Competent and professional monitoring or marine mammals and sea turtles; compliance with established monitoring policies.	Document contact with and approval by appropriate agencies. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	fk 8/16/16 (comm. K. Keen)
MM BIO-3: Safety Zone Monitoring.	Onboard Marine Wildlife Monitors (MWMs) responsible for observations during vessel transit shall be responsible for monitoring during the survey equipment operations. All visual monitoring shall occur from the highest practical vantage point aboard the survey vessel; binoculars shall be used to observe the surrounding area, as appropriate. The MWMs will survey an area (i.e., safety or exclusion zone) based on the equipment used, centered on the sound source (i.e., vessel, towfish), throughout time that the survey equipment is operating. Safety zone radial distances, by equipment type, include:	No adverse effects to marine mammals or sea turtles due to survey activities are observed; compliance with established safety zones.	Compliance with permit requirements (observers); compliance with established safety zones. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	fk 8/30 (MWM briefing) fk 8/31- 9/14 survey duration

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials												
	<table><tr><th>Equipment Type</th><th>Safety Zone (radius, m)</th></tr><tr><td>Single Beam Echosounder</td><td>50</td></tr><tr><td>Multibeam Echosounder</td><td>500</td></tr><tr><td>Side-Scan Sonar</td><td>600</td></tr><tr><td>Subbottom Profiler</td><td>100</td></tr><tr><td>Boomer System</td><td>100</td></tr></table> <p>If the geophysical survey equipment is operated at or above a frequency of 200 kilohertz (kHz), safety zone monitoring and enforcement is not required; however, if geophysical survey equipment operated at a frequency at or above 200 kHz is used simultaneously with geophysical survey equipment less than 200 kHz, then the safety zone for the equipment less than 200 kHz must be monitored. The onboard MWMs shall have authority to stop operations if a mammal or turtle is observed within the specified safety zone and may be negatively affected by survey activities. The MWMs shall also have authority to recommend continuation (or cessation) of operations during periods of limited visibility (i.e., fog, rain) based on the observed abundance of marine wildlife. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the onboard MWMs. During operations, if an animal's actions are observed to be irregular, the monitor shall have authority to recommend that equipment be shut down until the animal moves further away from the sound source. If irregular behavior is observed, the equipment shall be shut-off and will be restarted and ramped-up to full power, as applicable, or will not be started until the animal(s) is/are outside of the safety zone or have not been observed for 15 minutes.</p> <p>For nearshore survey operations utilizing vessels that lack the personnel capacity to hold two (2) MWMs aboard during survey operations, at least twenty-one (21) days prior to the commencement of survey activities, the Permittee may petition the CSLC to conduct survey operations with one (1) MWM aboard. The CSLC will consider such authorization on a case-by-case basis and</p>	Equipment Type	Safety Zone (radius, m)	Single Beam Echosounder	50	Multibeam Echosounder	500	Side-Scan Sonar	600	Subbottom Profiler	100	Boomer System	100	effective monitoring aboard small vessels	compliance with permit requirements (reporting sheet)			fk 8/18/16 comm. K. Keen regarding safety zones fk 8/31-9/14 survey duration
Equipment Type	Safety Zone (radius, m)																	
Single Beam Echosounder	50																	
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	factors the CSLC will consider will include the timing, type, and location of the survey, the size of the vessel, and the availability of alternate vessels for conducting the proposed survey. CSLC authorizations under this subsection will be limited to individual surveys and under any such authorization; the Permittee shall update the MWCP to reflect how survey operations will occur under the authorization.					
MM BIO-4: Limits on Nighttime OGPP Surveys.	All State waters; nighttime survey operations are prohibited under the OGPP, except as provided below. The CSLC will consider the use of single beam echosounders and passive equipment types at night on a case-by-case basis, taking into consideration the equipment specifications, location, timing, and duration of survey activity.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Presurvey request for nighttime operations, including equipment specifications and proposed use schedule. Document equipment use. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Approval required before survey is initiated. Monitoring Report following completion of survey.	fk n/a (no night ops)
MM BIO-5: Soft Start.	All State waters; the survey operator shall use a "soft start" technique at the beginning of survey activities each day (or following a shut down) to allow any marine mammal that may be in the immediate area to leave before the sound sources reach full energy. Surveys shall not commence at nighttime or when the safety zone cannot be effectively monitored. Operators shall initiate each piece of equipment at the lowest practical sound level, increasing output in such a manner as to increase in steps not exceeding approximately 6 decibels (dB) per 5-minute period. During ramp-up, the Marine Wildlife Monitors (MWMs) shall monitor the safety zone. If marine mammals are sighted within or about to enter the safety zone, a power-down or shut down shall be implemented as though the equipment was operating at full power. Initiation of ramp-up procedures from shut down requires that the MWMs be able to visually observe the full safety zone.	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Compliance with permit requirements (observers); compliance with safe start procedures. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Immediately prior to survey.	fk daily 8/31/16 -9/14/16

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MM BIO-6: Practical Limitations on Equipment Use and Adherence to Equipment Manufacturer's Routine Maintenance Schedule.	<p>All State waters; geophysical operators shall follow, to the maximum extent possible, the guidelines of Zykov (2013) as they pertain to the use of subbottom profilers and side-scan sonar, including:</p> <ul style="list-style-type: none"> Using the highest frequency band possible for the subbottom profiler; Using the shortest possible pulse length; and Lowering the pulse rate (pings per second) as much as feasible. <p>Geophysical operators shall consider the potential applicability of these measures to other equipment types (e.g., boomer). Permit holders will conduct routine inspection and maintenance of acoustic-generating equipment to ensure that low energy geophysical equipment used during permitted survey activities remains in proper working order and within manufacturer's equipment specifications. Verification of the date and occurrence of such equipment inspection and maintenance shall be provided in the required presurvey notification to CSLC.</p>	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	<p>Document initial and during survey equipment settings.</p> <p>Submit Final Monitoring Report after completion of survey activities.</p>	OGPP permit holder.	Immediately prior to and during survey.	<p>FK</p> <p>Aug 30 (science briefing)</p> <p>Aug 31 - sept 14</p>
MM BIO-7: Avoidance of Pinniped Haul-Out Sites.	<p>The Marine Wildlife Contingency Plan (MWCP) developed and implemented for each survey shall include identification of haul-out sites within or immediately adjacent to the proposed survey area. For surveys within 300 meters (m) of a haul-out site, the MWCP shall further require that:</p> <ul style="list-style-type: none"> The survey vessel shall not approach within 91 m of a haul-out site, consistent with National Marine Fisheries Service (NMFS) guidelines; Survey activity close to haul-out sites shall be conducted in an expedited manner to minimize the potential for disturbance of pinnipeds on land; and Marine Wildlife Monitors shall monitor pinniped activity onshore as the vessel approaches, observing and reporting on the number of pinnipeds potentially disturbed (e.g., via head lifting, flushing into the water). The purpose of such reporting is to provide CSLC and California Department of Fish and Wildlife (CDFW) with information regarding potential disturbance associated with OGPP surveys. 	No adverse effects to pinnipeds at haul outs are observed.	<p>Document pinniped reactions to vessel presence and equipment use.</p> <p>Submit Final Monitoring Report after completion of survey activities.</p>	OGPP permit holder.	Monitoring Report following completion of survey.	<p>fk</p> <p>n/a (no haul out sites locally)</p>

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MM BIO-8: Reporting Requirements – Collision.	<p>All State waters; if a collision with marine mammal or reptile occurs, the vessel operator shall document the conditions under which the accident occurred, including the following:</p> <ul style="list-style-type: none"> • Vessel location (latitude, longitude) when the collision occurred; • Date and time of collision; • Speed and heading of the vessel at the time of collision; • Observation conditions (e.g., wind speed and direction, swell height, visibility in miles or kilometers, and presence of rain or fog) at the time of collision; • Species of marine wildlife contacted (if known); • Whether an observer was monitoring marine wildlife at the time of collision; and, • Name of vessel, vessel owner/operator, and captain officer in charge of the vessel at time of collision. <p>After a collision, the vessel shall stop, if safe to do so; however, the vessel is not obligated to stand by and may proceed after confirming that it will not further damage the animal by doing so. The vessel will then immediately communicate by radio or telephone all details to the vessel's base of operations, and shall immediately report the incident. Consistent with Marine Mammal Protection Act requirements, the vessel's base of operations or, if an onboard telephone is available, the vessel captain him/herself, will then immediately call the National Oceanic and Atmospheric Administration (NOAA) Stranding Coordinator to report the collision and follow any subsequent instructions. From the report, the Stranding Coordinator will coordinate subsequent action, including enlisting the aid of marine mammal rescue organizations, if appropriate. From the vessel's base of operations, a telephone call will be placed to the Stranding Coordinator, NOAA National Marine Fisheries Service (NMFS), Southwest Region, Long Beach, to obtain instructions. Although NOAA has primary responsibility for marine mammals in both State and Federal waters, the California Department of Fish and Wildlife (CDFW) will also be advised that an incident has occurred in State waters affecting a protected species.</p>	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following completion of survey.	FK n/a (no collision occurred)

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MM BIO-9: Limitations on Survey Operations in Select Marine Protected Areas (MPAs).	All MPAs; prior to commencing survey activities, geophysical operators shall coordinate with the CSLC, California Department of Fish and Wildlife (CDFW), and any other appropriate permitting agency regarding proposed operations within MPAs. The scope and purpose of each survey proposed within a MPA shall be defined by the permit holder, and the applicability of the survey to the allowable MPA activities shall be delineated by the permit holder. If deemed necessary by CDFW, geophysical operators will pursue a scientific collecting permit, or other appropriate authorization, to secure approval to work within a MPA, and shall provide a copy of such authorization to the CSLC as part of the required presurvey notification to CSLC. CSLC, CDFW, and/or other permitting agencies may impose further restrictions on survey activities as conditions of approval.	No adverse effects to MPA resources due to survey activities are observed.	Monitor reactions of wildlife to survey operations; report on shutdown conditions and survey restart. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder; survey permitted by CDFW.	Prior to survey.	FK CDFW S.C.P. amendment applied July 2016 Rec'd Sept 2016
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Permittees shall develop and submit to CSLC staff for review and approval an OSCP that addresses accidental releases of petroleum and/or non-petroleum products during survey operations. Permittees' OSCPs shall include the following information for each vessel to be involved with the survey: <ul style="list-style-type: none"> Specific steps to be taken in the event of a spill, including notification names, phone numbers, and locations of: (1) nearby emergency medical facilities, and (2) wildlife rescue/response organizations (e.g., Oiled Wildlife Care Network); Description of crew training and equipment testing procedures; and Description, quantities, and location of spill response equipment onboard the vessel. 	Reduction in the potential for an accidental spill. Proper and timely response and notification of responsible parties in the event of a spill.	Documentation of proper spill training. Notification of responsible parties in the event of a spill.	OGPP permit holder and contract vessel operator.	Prior to survey.	FK spill plan present during survey 8/31-9/14
MM HAZ-2: Vessel fueling restrictions.	Vessel fueling shall only occur at an approved docking facility. No cross vessel fueling shall be allowed.	Reduction in the potential for an accidental spill.	Documentation of fueling activities.	Contract vessel operator.	Following survey.	FK, 8/31-9/14 proper fueling
MM HAZ-3: OSCP equipment and supplies.	Onboard spill response equipment and supplies shall be sufficient to contain and recover the worst-case scenario spill of petroleum products as outlined in the OSCP.	Proper and timely response in the event of a spill.	Notification to CSLC of onboard spill response equipment/supplies inventory, verify	Contract vessel operator.	Prior to survey.	Fk Kit present

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			ability to respond to worst-case spill.			
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Outlined under Hazards and Hazardous Materials (above)					fk, OSCP present 8/31-9/14
MM HAZ-2: Vessel fueling restrictions.	Outlined under Hazards and Hazardous Materials (above)					fk all fueling ok
MM HAZ-3: OSCP equipment and supplies.	Outlined under Hazards and Hazardous Materials (above)					fk
MM BIO-9: Limitations on Survey Operations in Select MPAs.	Outlined under Biological Resources (above)					CDFW MPA amendment FK
MM REC-1: U.S. Coast Guard (USCG), Harbormaster, and Dive Shop Operator Notification.	All California waters where recreational diving may occur; as a survey permit condition, the CSLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to divers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least twenty-one (21) days in advance of in-water activities, Permittees shall: (1) post such notices in the harbormasters' offices of regional harbors; and (2) notify operators of dive shops in coastal locations adjacent to the proposed offshore survey operations.	No adverse effects to recreational divers from survey operations.	Notify the USCG, local harbormasters, and local dive shops of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	fk 8/9/16 submitted email and hand delivered (3 local shops)

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MM FISH-1: U.S. Coast Guard (USCG) and Harbormaster Notification.	All California waters; as a survey permit condition, the CSLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to mariners and fishers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least twenty-one (21) days in advance of in-water activities, Permittees shall post such notices in the harbormasters' offices of regional harbors.	No adverse effects to commercial fishing gear in place.	Notify the USCG and local harbormasters of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	FK 8/9/16 submitted
MM FISH-2: Minimize Interaction with Fishing Gear.	To minimize interaction with fishing gear that may be present within a survey area: (1) the geophysical vessel (or designated vessel) shall traverse the proposed survey corridor prior to commencing survey operations to note and record the presence, type, and location of deployed fishing gear (i.e., buoys); (2) no survey lines within 30 m (100 feet) of observed fishing gear shall be conducted. The survey crew shall not remove or relocate any fishing gear; removal or relocation shall only be accomplished by the owner of the gear upon notification by the survey operator of the potential conflict.	No adverse effects to commercial fishing gear in place.	Visually observe the survey area for commercial fishing gear. Notify the gear owner and request relocation of gear outside survey area. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Immediately prior to survey (prior to each survey day).	FK all ok during survey 8/31-9/14
MM FISH-1: USCG and Harbormaster Notification.	Outlined under Commercial and Recreational Fisheries (above)					Fk 8/9/16 email

Acronyms/Abbreviations: CARB = California Air Resources Board; CDFW = California Department of Fish and Wildlife; CSLC = California State Lands Commission; dB = decibels; kHz = kilohertz; MPA = Marine Protected Area; MWCP = Marine Wildlife Contingency Plan; MWM = Marine Wildlife Monitor; m = meter(s); NOAA = National Oceanic and Atmospheric Administration; NO_x = Nitrogen Oxide; OGPP = Offshore Geophysical Permit Program; OSCP = Oil Spill Contingency Plan; USCG = U.S. Coast Guard